

An Affordability Comparison Tool (ACT) for Space Transportation

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NASA has recently emphasized the importance of affordability for Commercial Crew Development Program (CCDP), Space Launch Systems (SLS) and Multi-Purpose Crew Vehicle (MPCV). System architects and designers are challenged to come up with architectures and designs that do not bust the budget. This paper describes the Affordability Comparison Tool (ACT) analyzes different systems or architecture configurations for affordability that allows for a comparison of: total life cycle cost; annual recurring costs, affordability figures-of-merit, such as cost per pound, cost per seat, and cost per flight; as well as productivity measures, such as payload throughput. Although ACT is not a deterministic model, the paper develops algorithms and parametric factors that use characteristics of the architectures or systems being compared to produce important system outcomes (figures-of-merit). Example applications of outcome figures-of-merit are also documented to provide the designer with information on the relative affordability and productivity of different space transportation applications.

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